

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	Confirmation No.: 1734
CARFAGNINI, ITALO et al.	TC/Art Unit: 1764
Application No.: 10/574,638	Examiner: KRYLOVA, IRINA
Filed: March 31, 2006	Docket No.: 058009-021400
For: Plasto-elastomeric compositions	Date: 13th of June, 2011

Mail Stop Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

DECLARATION OF ALESSANDRO CARFAGNINI

I, ALESSANDRO CARFAGNINI, declare that:

1. I received an undergraduate degree in *Industrial Chemistry* from *Bologna University* in 2002.
2. I received a masters degree in *Industrial Chemistry* from *Bologna University* in 2002.
3. Since September 2005, I have been a *Scientist* in the Department of *Research and Development* at *So.F.Ter., S.P.A.*
4. I am aware of what constitutes ordinary skill in the art and knowledge in the art in thermoplastic elastomer. I closely and carefully follow the technical literature regarding this field.

5. I am submitting this declaration to respond to the Examiner's comments regarding U.S. Patent No. 4,477,631 issued to Sergio Danesi et al. ("Danesi"), European Patent Application Publication No. EP 0230212 ("Carfagnini"), International Publication No. WO 2004/026957 ("Credali"), U.S. Patent Application Publication No. US 2003/0013820 ("Yamanaka"), and U.S. Patent Application Publication No. US 2004/0209707 ("Sullivan"). I have read and understood the Examiners comments as to each of these references.
6. Danesi, Carfagnini, Credali, Yamanaka, and Sullivan, either alone or in combination, do not disclose, teach, or even suggest that a basic inorganic filler (such as,  $\text{Al}(\text{OH})_3$ ,  $\text{Mg}(\text{OH})_2$ , and  $\text{CaCO}_3$ ) can be added during crosslinking of a plasto-elastomeric mixture, which is catalyzed by aromatic carboxylic acid, without affecting the catalytic activity of the carboxylic acid.
7. The present invention is an evolution of a technology patented in the 1980s by So.F.Ter (U.S. Pat. 4,835,204; hereinafter "So.F.Ter"). This So.F.Ter patent, together with Danesi, describe how to produce plasto-elastomeric compositions containing cross-linked EPDM rubber. However, the chemical involved in the cross-linking process of the EPDM rubber make the difference, i.e., Danesi makes use of a non-halogenated resin and a metal compound; therefore its novelty was to avoid using halogenated chemicals. The So.F.Ter patent makes use of a non-halogenated resin and a carboxylic acid; therefore its novelty over Danesi was to avoid the use of metal compounds as a catalyst in the cross-linking reaction, which leads to several advantages over use of a metal compound for the same

purpose. The disclosure of Carfagnini discloses that additives are dispersed following cross-linking of the elastomeric component.

8. The problem addressed by the present invention was the need to add further functionality to plasto-elastomeric compositions so as to improve the flame retardant properties or the sound deadening properties of the compositions. Such properties are conveyed by specific fillers. The solution, as embodied by the present application therefore was a plasto-elastomeric composition that shows the typical mechanical properties of compositions containing a cross-linked EPDM rubber phase together with the additional properties conveyed by the specific fillers.
9. At the time of the present invention, basic fillers were considered incompatible with a cross-linking reaction catalyzed by a carboxylic acid. In fact, these fillers can inhibit the carboxylic acid from acting as a catalyst of the cross-linking reaction. Indeed, a person of ordinary skill in the art who would try to do so would not be able to obtain a plasto-elastomeric composition whose EPDM is properly crosslinked. Instead, the cross-linking reaction either does not occur or occurs at a very slow rate. Therefore, even if one of ordinary skill in the art somehow had been motivated to add fillers during the crosslinking step of a plasto-elastomeric mixture, there would have been no reasonable expectation of success of arriving at the claimed invention starting from the teachings of Danesi and Carfagnini, because the effect of adding an filler on crosslinking of a plasto-elastomeric mixture would have been unpredictable.

10. Credali's compositions are not intended to have a cross-linking reaction take place at any time, and thus are not the result of a cross-linking reaction/reactive blending process. Instead, they are the result of a melt blending process.
11. Finally, the claimed invention exhibited superior properties that a person of ordinary skill in the relevant art would have found surprising or unexpected in that basic inorganic fillers (such as,  $\text{Al}(\text{OH})_3$ ,  $\text{Mg}(\text{OH})_2$ , and  $\text{CaCO}_3$ ) do not affect the catalytic activity of carboxylic acid and thus cross-linking of a plasto-elastomeric mixture and filling can be carried out in a single process as presently claimed.
12. I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Respectfully submitted,

By   
Alessandro Carfagnini

## **Curriculum Vitae**

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### **Generalities:**

Born in June the 4<sup>th</sup> of 1979 in Forlì . Italian nationality. Free from military duties.

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### **Education:**

Winner of "Toso Montanari" studentship for higher education in 2003 a 12 months period was spent at the University of Pais Basque as collaborator in the group of Prof. J. Juan Iruin working on the devolpment of polymeric hybrid nanocomposites.

Qualified to join the Italian society of chemists examination passed in February 2003.

Five-years degree in Industrial Chemistry (mark: 105/110) gained in October 2002 at the University of Bologna with an experimental dissertation entitled: "*Sintesi asimmetriche industriali: nuovi catalizzatori derivati da precursori omochirali di farmaci di sintesi*" (*Asymmetrical industrial synthesis: new catalysts derived from omochiral precursors of drugs*). The experimental work (one year long) was carried out at the Department of Organic Chemistry 'A.Mangini', in the group of Prof. Goffredo Rosini.

Winner of a Socrates-Erasmus studentship in 1999 a 9 months period was spent at the Univerity of Hull, U.K.

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### **Working experience:**

From October 2005 working as part of R&D staff at So.F.Ter spa, company located in Italy, working in the field of compounding of plastics and thermoplastic rubbers (TPE) .

From March 2003 till September 2003 Collaborator of Prof.Corrado Berti at the Department of Applied Chemistry of the University of Bologna, working on coatings for biomedical pipes.

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### **Languages known:**

Good knowledge of English language, spoken and written

In the year 2000 were gained :

*Certificate of Advanced English, University of Cambridge*

*English for Academic Purposes, University of Hull.*

Good knowledge of Spanish language, spoken  
Basic knowledge of French language

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**Knowledge of softwares:**

*Familiar with the most common Windows based software. Knowledge of Chemdraw and the databases Scifinder.*

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**Knowledge of scientific equipment:**

HPLC HP1100, gaschromatographer HP6890, polarimeter Perkin Elmer 341, spectrophotometer IR Perkin Elmer 200, TGA TA Q500, DSC Perkin Elmer.

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**References:**

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